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09/574,448

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Wen Hsuan Hsieh

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EXAMINER

HARVEY, DIONNE

ART UNIT

PAPER NUMBER

2643

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|------------------------------|--|
| Office Action Summary | Application No. 09/574,448 | Applicant(s) HSIEH ET AL. | |
| | Examiner Dionne N Harvey | Art Unit 2643 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-74 is/are pending in the application.
- 4a) Of the above claim(s) 1-23 55-74 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 24-54 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group III in the reply filed on January 23, 2004 is acknowledged. This application contains claims 1-23 and 55-74, which are drawn to an invention nonelected without traverse. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Objections

Claim 52 is objected to because of the following informalities: Claim 52 refers to itself in the claim preamble. Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 47 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession

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of the claimed invention. Claim 47 is amended to recite " ...an array of more than 25,000 holes..." The Applicant's specification provides no support for said amendment.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

a. Claim 24 recites the limitation "the backplate membrane layer" in lines 8-9 of claim 24. There is insufficient antecedent basis for this limitation in the claim.

b. Claim 53 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Lines 7-9 of claim 53 recites, " ... a second electrode is formed by micro-machining techniques having a front face and a rear face..."

Correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 24-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Sprenkels (US 4,910,840).

Regarding claim 24, In figure 2, Sprenkels teaches an electret transducer, comprising: a diaphragm including an IC-compatible membrane support structure (9)

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and a polymeric membrane layer (membrane foil - 2 is constructed from Mylar film; see column 8, line 27) formed on the membrane support by micro-machining techniques, the transducer diaphragm having a first electrode (1); a backplate (5) having a second electrode (in column 5, line 45, Sprenkels teaches that the motor portion of the backplate will comprise a bottom electrode) and formed by micro-machining techniques; **as *best understood with regard to the U.S.C 112 second paragraph rejection*** above, Sprenkels appears to teach the back plate- membrane layer (5) having a front face and a rear face (shown), and having a plurality of cavities (8) extending from the front face to the rear face and through said second electrode (see column 6, lines 1-5 wherein Sprenkels teaches that the backplate-5 also functions as the bottom electrode. Therefore, cavities-8 which extend through the backplate-5 member, also extend through the second electrode, as claimed), thereby providing for communication between the front face and a back volume behind the rear face; and an electret layer (4) formed on at least one of the diaphragm or backplate, the diaphragm being positioned adjacent to the backplate to form an electret transducer. In column 2, line 35-37 and column 6, lines 21-29, Sprenkels specifically teaches micro-machining techniques.

Regarding claim 25, Sprenkels teaches that the polymeric membrane layer includes one of Mylar, FEP, PTFE fluoropolymer, Teflon, polyimide, a silicone, or parylene.

Regarding claim 26, Sprenkels teaches that the polymeric layer has a thickness in the range from *about* 0.1 mm to *about* 10 mm, as broadly claimed.

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Regarding claim 27, Sprenkels teaches that the polymeric membrane layer is spun or deposited onto the membrane support using micro-machining techniques.

Regarding claim 28, in column 6, lines 35-37, Sprenkels teaches that the membrane support structure (9), which is a part of the larger backplate structure, is formed from an electrically insulating or semi-conducting glass, ceramic, crystalline, or polycrystalline.

Regarding claim 29, Though Sprenkels teaches the use of glue for adhering the polymeric membrane layer to the edge portions of the backplate, Sprenkels teaches that the polymeric membrane layer adheres to the membrane support structure (9) without gluing (see figures).

Regarding claim 30, Sprenkels teaches that the backplate comprises a backplate support structure (7) defining said back volume (6) and has a backplate membrane layer (5) (see the lower portion of backplate-5, to which support-7 is mounted) formed on the backplate support structure.

Regarding claim 31, shown in figure 6 and In column 6, lines 38-40, Sprenkels teaches a polymeric reinforcing film (14) formed on the backplate.

Regarding claim 32, Sprenkels teaches that the film is SiO₂ and therefore teaches one of Mylar, FEP, PTFE fluoropolymer, Teflon, polyimide, a silicone, or parylene.

Regarding claim 33, Sprenkels teaches that the polymeric reinforcing layer is *about* 2.51 mm thick, as broadly claimed.

Regarding claim 34, Sprenkels teaches that the polymeric membrane layer is spun or deposited onto the membrane support using micro-machining techniques.

Regarding claim 35, in column 6, lines 35-37, Sprenkels teaches that the membrane support structure, which is a part of the larger backplate structure, is formed from an electrically insulating or semi-conducting glass, ceramic, crystalline, or polycrystalline.

Regarding claim 36, in figure 4, The Examiner has interpreted element 14, which is disposed above membrane support (9) as providing at least one spacer.

Regarding claim 37, in figure 1, Sprenkels teaches that the plurality of cavities (8,11) comprises an array of *about at least* 25,000 holes extending through out the backplate member, as broadly claimed.

Regarding claim 38, Sprenkels teaches that the membrane has a diameter of *about* 8 millimeters, as broadly claimed.

Regarding claim 39, in column 7, lines 1-2, Sprenkels teaches that the air gap is *about* 4.5 mm deep, as broadly claimed.

Regarding claim 40, In figure 2, Sprenkels teaches an electret transducer, comprising: a diaphragm including a membrane support structure (9) and a membrane layer formed on the membrane support by micro-machining techniques, the transducer diaphragm having a first electrode (1); a backplate having a second electrode (in column 5, line 45, Sprenkels teaches that the motor portion of the backplate will comprise a bottom electrode) and formed by micro-machining techniques; the backplate comprising a backplate support structure (7) defining a back volume (6) and a backplate

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membrane layer (5) formed on the backplate support structure; the backplate membrane layer (5) having a front (see surface side defined by recessed portion – 3) and a rear face (see surface side defined by air gap – 6), the backplate membrane layer (5) comprising a plurality of cavities (8,11) extending from the front face to the rear face and through the second electrode (see column 6, lines 1-5 wherein Sprenkels teaches that the backplate-5 also functions as the bottom electrode. Therefore, cavities-8 which extend through the backplate-5 member, also extend through the second electrode, as claimed), thereby providing for communication between the front face (3) and the back volume (6); an electret layer (4) formed on at least one of the diaphragm or backplate, the diaphragm being positioned adjacent to the backplate to form an electret transducer. In column 2, line 35-37 and column 6, lines 21-29, Sprenkels specifically teaches micro-machining techniques.

Regarding claim 41, shown in figure 6, In column 6, lines 38-40, Sprenkels teaches a polymeric reinforcing film (14) formed on the backplate.

Regarding claim 42, Sprenkels teaches that the film is SiO₂ and therefore teaches one of Mylar, FEP, PTFE fluoropolymer, Teflon, polyimide, a silicone, or parylene.

Regarding claim 43, Sprenkels teaches that the polymeric reinforcing layer is *about* 2.51 mm thick, as broadly claimed.

Regarding claim 44, Sprenkels teaches that the polymeric membrane layer is spun or deposited onto the membrane support using micro-machining techniques.

Regarding claim 45, in column 6, lines 35-37, Sprenkels teaches that the membrane support structure, which is a part of the larger backplate structure, is formed from an electrically insulating or semi-conducting glass, ceramic, crystalline, or polycrystalline.

Regarding claim 46, in figure 4, The Examiner has interpreted element 14, which is disposed above membrane support (9) as providing at least one spacer.

Regarding claim 47, in figure 1, Sprenkels teaches that the plurality of cavities (8,11) comprises an array of *about* 25,000 holes extending through out the backplate member, as broadly claimed.

Regarding claim 48, Sprenkels teaches that the membrane has a diameter of *about* 8 millimeters, as broadly claimed.

Regarding claim 49, in column 7, lines 1-2, Sprenkels teaches that the air gap is *about* 4.5 mm deep, as broadly claimed.

Regarding claim 50, Sprenkels teaches an open-circuit sensitivity greater than *about* 25 mV/Pa, as broadly claimed.

Regarding claim 51, Sprenkels teaches a noise level of less than *about* 30 dB SPL , as broadly claimed.

Regarding claim 52, Sprenkels teaches a total harmonic distortion of less than *about* 2% at 110 dB SPL at 650 Hz, as broadly claimed.

Regarding claim 53, In figure 2, Sprenkels teaches an electret transducer, comprising: a diaphragm including an IC-compatible membrane support structure (9) and a membrane layer formed on the membrane support by micro-machining

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techniques, the transducer diaphragm having a first electrode (1); a backplate (5) having a second electrode (in column 5, line 45, Sprenkels teaches that the motor portion of the backplate will comprise a bottom electrode) and ***as best understood with regard to the U.S.C. 112 second paragraph rejection above***, appears to teach that the second electrode is formed by micro-machining techniques having a front face and a rear face (shown), and having a plurality of cavities (8) extending from the front face to the rear face and through said second electrode (see column 6, lines 1-5 wherein Sprenkels teaches that the backplate-5 also functions as the bottom electrode. Therefore, cavities-8 which extend through the backplate-5 member, also extend through the second electrode, as claimed), thereby providing for communication between the front face and a back volume behind the rear face; and an electret layer (4) formed on at least one of the diaphragm or backplate, the diaphragm being positioned adjacent to the backplate to form an electret transducer having an open-circuit sensitivity greater than *about* 25 mV/Pa (as broadly claimed), a noise level of less than *about* 30 dB SPL (as broadly claimed), and a total harmonic distortion of less than *about* 2% at 110 dB SPL at 650 Hz (as broadly claimed). In column 2, line 35-37 and column 6, lines 21-29, Sprenkels specifically teaches micro-machining techniques.

Regarding claim 54, Sprenkels teaches an open-circuit sensitivity greater than *about* 35 mV/Pa, as broadly claimed.

Response to Arguments

2. Applicant's arguments filed 8/2/2004 have been fully considered but they are not persuasive. Regarding the Applicant's argument that "Taking the opening 8 as exemplary, after the opening is made, it is covered with a membrane foil; see for example column 8, lines 25-28. That membrane foil is then covered with a layer of conductive material such as copper, shown as 16 in figure 11, see column 8, lines 42-48. Therefore, it should be seen that whatever cavities are formed e.g. 8 and 11 in 840, that cavity certainly does not extend through the electrode layer." The Applicant is erroneous in his assertion that **column 8, lines 42-48** of Sprenkels discloses that both apertures **8** and **11** are covered by layer **16**. In fact, only aperture **11**, which serves as an 'attachment opening' is disclosed as being covered by layer **16** in the disclosure of Sprenkels. Additionally, only aperture **11** is illustrated in the figures as having layer **16** attached thereto. While **column 8, lines 25-28** does teach "the side of the wafer containing air cavities is then covered with a membrane foil", said membrane foil **2** is shown in figure 2 as being attached to the back plate member **5** in such a way as to permit the formation of air gap **3**. The portions of the back plate member **5** which define the bottom boundary of the air gap **3** are not in contact with the membrane foil **2** and have been interpreted by the examiner as reading on the "front face" of the back plate membrane. The rejection of claims 24, above, clearly sets forth the Examiner's interpretation of Sprenkels and it's anticipation of the newly added limitation of a cavity extending from the front face to a rear face of the back plate and through the second electrode. Therefore, Sprenkels is found to meet the limitations of the newly amended claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dionne N Harvey whose telephone number is 703-305-1111. The examiner can normally be reached on 9-6:30 M-F and alternating Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on 703-305-4708. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dionne Harvey


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